



# National Forests

In CALIFORNIA

# Nature's Benefits REFORESTATION



## WHAT IS REFORESTATION?

- Reforestation is the growing and nurturing of trees so as to maintain healthy, resilient forests capable of delivering values, known as “Nature’s Benefits.”
- These values are the things that people see, feel, hear and rely on in their daily lives and include: clean air and water, carbon sequestration, habitat for native fish and wildlife, forest products, aesthetic benefits, outdoor recreation, jobs, and more.
- When we restore our Nation’s forests, we create jobs and benefit the environment at the same time.<sup>1</sup>

## *Why is it important to reforest California National Forests after a harvest or severe wildfire?*

- Today, climate change, high severity wildfire, bark beetle infestation, invasive species, record droughts, and other stressors threaten the health of our forest and watersheds, **and** the health and livelihoods of people that rely on them.
- Re-establishing new forests by planting ensures that sufficient numbers of desired tree species are available to meet future needs.
  - Planting is especially valuable when disturbances have created large

openings, as seedlings can be planted wherever suitable planting spots exist.

- Trees produce seed which can also contribute to the development of new forests.
  - Unfortunately, seed is not produced in predictable ways and—unless it is available soon after a landscape disturbance—germination and rapid growth is much less likely occur.

### **KING FIRE—AN EXAMPLE**

- In 2014, the King Fire burned 64,000 acres on the Eldorado National Forest. Half of these acres burned with an intensity that killed all of the trees.
- Where fire created large forest openings, seeds from surviving mature trees were unable to reach the center of these openings, and therefore planted seedlings offered the only chance of prompt reestablishment of forest cover.<sup>2</sup>



<sup>1</sup> <https://www.fs.fed.us/restoration/reforestation/index.shtml>

<sup>2</sup> <https://www.americanforests.org/magazine/article/place-based-partnerships-american-forests-and-intel-commit-to-king-fire-restoration/>



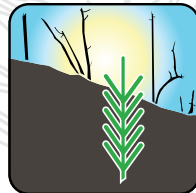
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- Larger and more **severe** wildfires are now the main cause of forest cover loss in the Western United States.
  - They are responsible for 80% of all the national forest lands that need reforestation.



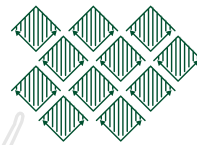
- Prompt reforestation after a harvest or severe wildfire ensures Californians continue to receive vital, life-supporting Nature's Benefits they rely on from our National Forests.



- Reforestation allows for the accelerated development of:
  - forest structure,
  - desired species composition, AND
- A forest canopy that provides:
  - wildlife habitat
  - clean and abundant water
  - carbon sequestration
  - forest wood products for consumers
  - forested recreation opportunities, and
  - maintenance of soil creation through soil erosion reduction. <sup>1</sup>
- Re-establishing and retaining resilience of our National Forests to achieve sustainable management provides multiple Nature's Benefits to:
  - households and communities
  - industries, and
  - agriculture

## How much is reforested on California's National Forests?

ON AVERAGE ABOUT **11,000** ACRES



ARE PLANTED ANNUALLY.

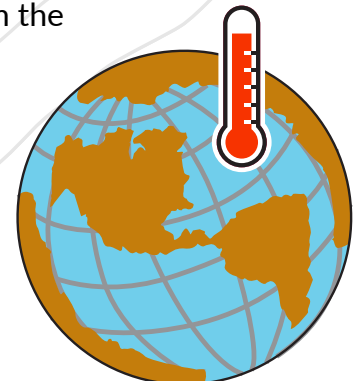
- That's about **2.4** million seedlings planted.
- The \$154 per acre invested in reforestation supports 30 jobs, likewise increasing reforestation to **100,000 ACRES** would create approximately



## What are the Nature's Benefits from California National Forests reforestation efforts?

### CLIMATE CHANGE AND CARBON

- Forests naturally remove carbon dioxide (CO<sub>2</sub>) from the atmosphere.
  - This means that healthy forests are a powerful tool for mitigating and adapting to climate change.



<sup>1</sup> <https://www.fs.fed.us/forestmanagement/vegetation-management/reforestation/index.shtml>



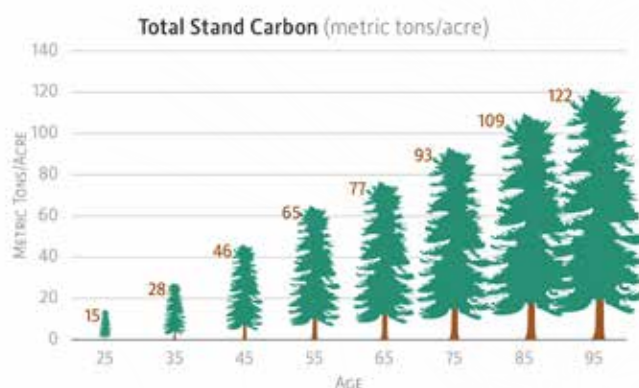
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(continued)

- As trees grow, they store carbon in their branches, trunks, and roots and—if managed sustainably—will continue to store carbon for a long time.<sup>1</sup>
- High severity fire areas can delay natural regeneration by many decades and convert landscapes to non-forest areas with climate change and fire, making managed efforts to replant, a carbon positive endeavor.

The example below illustrates the accumulation of carbon over time in a mixed conifer forest of average productivity.<sup>2</sup>



- Note the increase in carbon storage as trees get older and larger (graph above). As an example:
  - Depending on the species of tree, a single tree can absorb as much as 48 lbs (21.77 kgs) of CO<sub>2</sub> per year, assuming relatively little disturbance and the likelihood of change in trend, up or down.
  - California National Forests sequester 2.7 Million Metric Tons annually.<sup>3</sup>

## CLEAN AIR

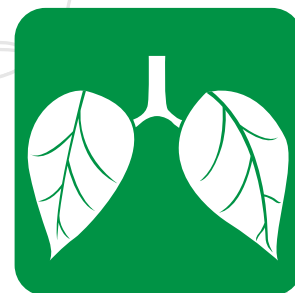
Trees can help reduce the amount of CO<sub>2</sub> in the air and may assist in reducing global warming.

- In fact, trees “trap” small atmospheric particles of all sorts on their leaves, branches, and stems and thereby help cleanse the air, reducing heat (through tree shade and evapotranspiration), and absorbing such pollutants as carbon monoxide, sulfur dioxide, and nitrogen dioxide.

## WATER

Replanting trees restores a forest's ability to protect our headwaters, and in California, that's over 50% of California's water supply.

- Forests can offer protective cover for erosion-prone soil, both by shielding it from the impact of raindrops that move soil particles, and by intercepting rain and snow before it infiltrates into the soil downstream.
  - This is especially valuable on steep slopes, where on unprotected soil, sediment can be moved downslope into streams and rivers and, in some cases, to downstream reservoirs.
- Additionally, winter's snowfall, partially hidden under the forest canopy, slows melting and sustains stream flows later into the summer.



<sup>1</sup><https://www.nationalforests.org/get-involved/tree-planting-programs/climate>

<sup>2</sup>R5 Silviculturist/2020 Forest Vegetation Simulator <https://www.fs.fed.us/r5/index.shtml>

<sup>3</sup><https://bofdata.fire.ca.gov/projects-and-programs/ab-1504>





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- A healthy and resilient forest able to withstand severe fire can naturally reduce water pollutants—in the form of soil and ash—that would otherwise contribute to the filling of reservoirs reducing water clarity, and adversely affecting plant and animal habitats.

## FOREST PRODUCTS

In 50 years, **one acre** of planted mixed conifer forest provides approximately



**30,000 board feet**, to continue to grow at a more favorable tree density and with a reduced level of hazardous fuel.<sup>1</sup>

## RECREATION

Tree cover offers recreation opportunities such as hiking, camping, skiing, nature viewing, and hunting.



- Tree planting provides significant value to those forest visitors seeking to engage in specific activities and provides an economic boost to local and state recreation industries, including jobs.
- It also improves the visual quality of a forest, making it a place to practice cultural traditions, engage in family bonding, and practice restorative health through “forest bathing”.<sup>2</sup>

- As a result of the **254,654 acres burned** in the 2013 Rim Fire, over



- Promoting the growth of tree stands by replanting sooner rather than later can more quickly restore recreation to full levels and meet the forest and the public's more near-term needs.
  - This is especially important in the face of climate change and other factors negatively impacting future seed availability and favorable growing locations.

## What can you do to assist?

The scale and severity of current day wildfires often leads to devastating impacts to forest resources and a variety of post-fire recovery needs resulting in sharp increases in reforestation needs on many of our national forests.

California's National Forests are everyone's Forests to enjoy and protect. As citizens, you can show your love of trees by:

1. recreating with a light footprint,
2. being good citizen stewards
3. sharing with people how the Nature's Benefits you enjoy from trees on National Forest System lands make your life better on a daily basis, and

<sup>1</sup> R5 Silviculturist/2020 Forest Vegetation Simulator, <https://www.fs.fed.us/fvs/index.shtml>

<sup>2</sup> <https://link.springer.com/content/pdf/10.1007/s12199-008-0068-3.pdf>  
<https://www.mdpi.com/1660-4601/14/8/864/htm>

<sup>3</sup> [https://inba.info/earth-economics-rim-fire-report-11272013\\_57703663b6d87f28318b4e65.html](https://inba.info/earth-economics-rim-fire-report-11272013_57703663b6d87f28318b4e65.html)

4. volunteering to **plant trees** on a National Forest near your community.

While the U.S. Forest Service collects seeds and plant seedlings, our partners help us further our reforestation efforts through various annual tree planting programs they run and make available to the public:

1. National Forest Foundation (NFF)
2. National Wildlife and Fish Foundation works (NFWF)
3. American Forests
4. Penny Pines Plantation
5. Arbor Day Foundation
6. One Tree Planted



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